Table 1. Survival predictability of models based on different sets of factors

Factors in model	–2LL
Diabetes mellitus	597.734
Diabetes mellitus and age	590.693
CCI	588.522
Diabetes mellitus and modified CCI (without diabetes weight)	581.744
Modified CCI (with diabetes weight calculated at 3)	583.596

research with only 13 patients with diabetes (2.2% of their total population), and that diabetic patients on haemodialysis could suffer from a more pronounced degree of angiopathy than diabetics without renal failure. This modified CCI model achieved the same predictive power as the previous scenario without neglecting any of the components of CCI. (Interestingly, increasing the weight of diabetes to ≥ 4 did not improve the model's predictive power.)

We realize that our results need to be verified by further research. However, in order to compare the results of different studies, a uniform original approach to CCI should be used until modifications are approved by the scientific community.

Another important point is that Kalantar-Zadeh *et al.* fail to resolve whether inflammation–malnutrition markers correlate with CCI, or with any co-morbidities in particular, and whether differences in predictors of mortality and hospitalization may be found between diabetics and non-diabetics. However, these factors may considerably influence the inflammation–malnutrition markers.

Conflict of interest statement. None declared.

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Reply

Sir,

The points mentioned by Bikbov are appreciated. However, the focus of our study [1] was to compare the outcome predictability of 10 markers of the malnutrition–inflammation complex syndrome (MICS) with each other. Hence, our finding on the significant association of the Charlson co-morbidity index (CCI), which represented a covariate to adjust for, with mortality and hospitalization deserving only a brief mention in that context. The outcome predictability of CCI and its statistical associations with elements of MICS in maintenance dialysis patients are subjects of another ongoing but separate study within our group, which will be reported in the future.

Other groups have also modified the CCI by excluding age as a component [2]. We believe this is a legitimate approach, especially since age has a strong bearing on mortality and can confound the independent value of co-morbid conditions in predicting outcome. Since all dialysis patients have end-stage kidney disease, there is no statistical gain in including this universally positive component. No other changes were implemented in the CCI in our study. We maintained diabetes mellitus in the CCI, since diabetes is divided into two distinct categories (with and without end-organ damage). It is interesting that Bikbov, too, has decided to modify the CCI by changing the weight factor for diabetes. Such modifications, if they lead to improved correlations, are warranted.

With regard to the malnutrition–inflammation score (MIS), only one out of the 10 MIS components is about co-morbid conditions in a limited format, i.e. with four levels of severity for the entire co-morbidity, whereas the modified CCI we used had a fully quantitative score ranging from 0 to 24 [1]. We, too, believe that CCI is a valuable and practical tool with important clinical applications in risk stratification and outcome prediction in maintenance dialysis patients.

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